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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/585,659 06/02/00 FODOR

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EXAMINER

HM12/0411

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ART UNIT

PAPER NUMBER

1655

DATE MAILED:

04/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/585,659

Applicant(s)
FODOR et al.

Examiner
Stephanie Zitomer

Group Art Unit
1655



☒ Responsive to communication(s) filed on Sep 18, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 26-69 is/are pending in the application.

Of the above, claim(s) 43-45, 47-50, 52, and 57-69 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 26-42, 46, 51, and 53-56 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☒ The proposed drawing correction, filed on Sep 18, 2000 is ☒ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2, 4, 10

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Informalities

1. The disclosure is objected to because of the following informalities:

(a) The paragraph of continuing information in the amendment to page 1 of the specification needs to be updated as to the status of the '904 application.

(b) The changes to the figures filed September 18, 2000 to delete Figures 2 and 3 and renumber Figure 4 have been approved by the examiner. The figure description at page 8 of the specification must be amended to cite Figures 2A-2M as these are considered individual figures.

Appropriate correction is required.

Restriction and election

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 26-42, 46, 51 and 53-56, drawn to polymers (oligonucleotide, peptide and protein species) attached to beads, classified in class 536, subclass 24.3 and class 530, subclass 300;
- II. Claims 43-45, 52, 63 and 65, drawn to a system comprising a collection of beads having polymers attached thereto and bead sorting and decoding apparatus, classified in class 435, subclass 287.3 and 288.7;
- III. Claims 57-62, 64 and 66-69, drawn to polymers (oligonucleotide and peptide species) attached to fibers, classified in class 536, subclass 24.3 and class 530, subclass 300.

3. Inventions II and I, III are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (M.P.E.P. § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination can be used with polymers other than oligonucleotides such as peptides. The subcombination has separate utility such as use as probes in binding assays.

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4. Inventions I and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MEP. § 806.04, MEP. § 808.01). In the instant case the different inventions, beads and fibers, have different modes of operation in that fibers may be woven or pressed into filter-type forms and beads may be packed in chromatography columns.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, separate status in the art and recognized divergent subject matter and because the search for one invention is not co-extensive with the search for another invention, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Gary Tanigawa on March 12, 2001 a provisional election was made with traverse to prosecute the invention of I, claims 26-42, 46, 51 and 53-56. Affirmation of this election must be made by applicant in replying to this Office action. Claims 43-45, 47-50 and 57-69 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Rejections under 35 U.S.C. 112, first paragraph: Lack of written description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 26,-42, 46, 51 and 53-56 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claimed invention is a collection of different beads having at least one attached polymer of specific sequence wherein the beads are coded by an encoding system which indicates the polymer sequence. Such beads are briefly discussed at page 37 of the specification as a collection of beads which may be sorted after "contacting" according to the reagents which have bound to target molecules using sorting devices known in the art. The specification goes on to say

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that after sorting and collecting "the encoding scheme may be read off to determine the specificity of the reagent on the bead". The "encoding system" is next referred to in the specification in two sentences at page 37. It is stated therein that the "encoding system" may be "a magnetic system, a shape encoding system, a color encoding system, or a combination of any of these, or any other encoding system". While such systems were generally known in the art and colored beads for immobilizing biological reagents, for example, were commercially available, the skilled practitioner in the art would not have known *a priori* which "encoding system" or combination of "encoding systems" would be workable with the claimed invention method absent some guidance in the specification. However, the specification fails to teach or provide guidance for selecting an appropriate "encoding system" or for combining two or more such systems or for making or using the claimed method of analysis with an "encoding system". There is no description of the chemical nature, i.e., the composition, of the encoding system or of the coding mechanism. Is not taught whether the "encoding system" is part of the substrate which bears the reagents or is a separate entity. Furthermore, the "encoding system" of the claims constitutes a large genus of encoding system species a representative number of which must be described to fulfill the written description requirement of 112, first paragraph. The skilled practitioner in the art would not have been apprised of the scope of the claimed invention absent a proper description of the encoding systems contemplated by applicant. For example, bar codes and nucleotide sequences were encoding systems practiced in the prior art which are not mentioned in the specification. In addition to enablement the first paragraph of 112 requires a "written description". As set forth by the Court in *Vas-Cath Inc. v. Mahurkar*, 19 USPQ2d 1111, the written description must convey to one of skill in the art "with reasonable clarity" that as of the filing date applicant was in possession of the claimed invention. In the present case it is clear that applicant was not in possession at the time of filing of the claimed invention method with "encoding system" in view of the absence of teaching or guidance as to the nature of this "system" and how to make and use it with the claimed invention beads.

Note: In view of the lack of written description as set forth above, the claims are entitled only to the filing date of the present application, June 2, 2000.

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8. Claims 39 and 40 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims are drawn to embodiments of the collection of beads of claim 26 wherein the beads are comprised of a glass surface (claim 39) and "amines of poly-aminopropyltriethoxysilane thereon" and the polymers are attached via the amines. In claim 40 the beads are comprised of a surface and hydroxyl groups of an acrylic acid polymer and the polymers are attached through the hydroxyl groups. Applicant has cited page 76 of the "original specification" (taken to be the continuing application parent, 07/624,114) as supporting these claims (Preliminary Amendment filed with the application). However, page 76 (page 74 in the present application) describes methods of forming a positionally defined matrix pattern on a substrate and attaching polymers to the matrix at defined locations employing, in part, the chemistries and substrates recited in the claims. (See the last paragraph on page 73 bridging page 74.) There is no disclosure of polymers attached to beads by the aforementioned chemistries or any other. On the contrary, page 75 of the present specification teaches that the "fourth method" of preparing a substrate "utilizes synthetic beads...which would use another substrate, such as a Teflon copolymer graft bead...covalently coated with an organic layer (hydrophilic)..." as recited in claim 41. Thus the substrate preparation for beads is set apart from that for other supports. The Court has stated that in addition to enablement the first paragraph of 112 requires a "written description". As set forth by the Court in *Vas-Cath Inc. v. Mahurkar*, 19 USPQ2d 1111, the written description must convey to one of skill in the art "with reasonable clarity" that as of the filing date applicant was in possession of the claimed invention. In view of the failure of the specification to teach how to make and use the claimed invention it is clear that one of skill in the art would not have recognized that applicant was in possession of the claimed invention at the time the application for patent was filed.

Rejections under 35 U.S.C. 112, second paragraph: Indefiniteness

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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9. Claims 26-42, 46, 51 and 53-56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) The claims are confusing in the recitation "collection of beads comprised of different beads" because the meaning of "different" is unclear, e.g., as individual beads or as beads differing in physical characteristics such as size, shape, color, etc. Clarification is required.

(b) The claims are further confusing because the relationship, if any, between the "different" beads and "coding" is unclear. Clarification is required.

(c) The claims are confusing further because in the polymer art a non-biological "polymer" does not have a "sequence" although it may comprise several different monomer species and be referred to as a "copolymer", "block copolymer", etc.. Clarification is required.

(d) The claims lack proper antecedent basis in "at least one polymer" for "the polymer attached to a single bead". Clarification is required. It is suggested to use "each" and "different sequence" where appropriate.

(e) Claims 28, 29 and 34-36 are confusing because the number of oligonucleotides attached to a single bead is unclear. It is suggested to insert --each-- before "attached" if that is the intended meaning.

(f) Claims 34-36, like claim 26, are confusing as whether all the oligonucleotides are attached to the same "different bead" or each oligonucleotide is attached to a "different bead".

(g) Claims 38 and 51 are confusing due to improper syntax. It is suggested to recite that the protein is selected from the group consisting of proteins having enzyme binding sites and proteins having antibody sites.

(h) Claims 39-41 and 53 lack proper antecedent basis in claim 26 for "plurality of beads" and "polymers". It is suggested to insert --the-- either before "plurality" or before "beads" depending on the intended antecedent. See also "hydroxyl groups" in line 3 of claim 40 wherein the antecedent "hydroxyl groups" in line 2 should be referred to by an inserted specific --the--.

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Rejections under 35 U.S.C. 102(b)/103(a): Anticipation/inherency

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CAR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 26, 37 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, obvious under 35 U.S.C. 103(a), over Mochida Pharmaceutical Co., Ltd. (Mochida herein). Mochida discloses the claimed invention collection of beads wherein a plurality of the beads have at least one polymer, wherein the polymer is a polypeptide (an antibody), attached thereto (page 2, lines 20-21) and wherein the plurality of beads having at least one attached polymer are coded by an encoding system (e.g., bar code or magnetic tape, page 3, line 62) which indicates the specific polymer attached to a single bead (page 1, lines 62-63). This rejection is based on judicial precedent following *In re Fitzgerald*, 205 USPQ 594 because Mochida is silent with regard to the encoding system indicating the sequence of the polymer. However, the sequence of the polymer is deemed to be inherent in the type of antibody specified in the coded information because antibodies were known in the art by their type and the amino acid sequences were known for the antibody type. The burden is on applicant to show that the sequence indicated in the encoding system in the

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claims is either different or nonobvious over that of Mochida. Alternatively, it would have been obvious to one of ordinary skill in the art to attach the peptide antigen to the beads for screening for the antibody and to encode the peptide sequence in the encoding system in view of the routine practice in the art of immobilizing peptides on supports and screening for antibodies to the peptides.

9. Claims 26, 27, 37, 39, 42 and 54 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, or in the alternative, obvious over, the patent to Mandecki (5,641,634). Mandecki discloses the claim 26 invention collection of beads having at least one polymer of a specific sequence attached thereto and coded by an encoding system (column 4, lines 14-23; column 3, lines 63-67). Regarding claims 27 and 37, Mandecki discloses that the polymers are oligonucleotides, polynucleotides, polypeptides, peptides and nucleic acids (column 3, lines 46-62). Regarding claim 39, Mandecki discloses that the beads are comprised of a glass surface and amines of poly-aminopropyltriethoxysilane thereon and the polymers are attached through amines on the glass surface (column 7 at 1. and 2.). Regarding claim 42, Mandecki discloses that the encoding system is electromagnetic (column 4, lines 41-43). Regarding claim 54, Mandecki discloses that the attached oligonucleotides are comprised of at least one nucleotide analogue (column 3, line 63-column 4, line 1). This rejection is based on judicial precedent following *In re Fitzgerald*, 205 USPQ 594 because Mandecki is silent with regard to the encoding system indicating the sequence of the polymer. However, the sequence of the polymer is deemed to be inherent in the index number specified in the coded information because it was routine practice in the art to use oligonucleotides of specific sequence as probes or primers for target detection assays. The burden is on applicant to show that the sequence indicated in the encoding system in the claims is either different or nonobvious over that of Mandecki. Alternatively, it would have been obvious to one of ordinary skill in the art to encode the polymer sequence in the encoding system of Mandecki for the obvious benefit of specific identification of a binding sequence in an assay.

10. Claims 26, 37 and 42 are rejected under 35 U.S.C. 102(b)/103(a) as being anticipated by, or in the alternative, obvious over, the patent to Nova et al. (5,751,629). Nova et al. disclose the claim 26 invention collection of beads having at least one polymer

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of a specific sequence attached thereto and coded by an encoding system (column 4, line 62-column 5, line 9; column 10, line 65-column 11, line 9). Regarding claim 37, Nova et al. disclose that the polymers are polynucleotides or polypeptides (column 13, lines 17-32). Regarding claim 42, Nova et al. disclose that the encoding system is electromagnetic (column 12, lines 55-56). This rejection is based on judicial precedent following *In re Fitzgerald*, 205 USPQ 594 because Nova et al. is silent with regard to the encoding system indicating the sequence of the polymer. However, the sequence of the polymer is deemed to be inherent in the information encoded in the encoding system because it was routine practice in the art to use oligonucleotides of specific sequence as probes or primers for target detection assays. The burden is on applicant to show that the sequence indicated in the encoding system in the claims is either different or nonobvious over that of Nova et al.. Alternatively, it would have been obvious to one of ordinary skill in the art to encode the polymer sequence in the encoding system of Nova et al. for the obvious benefit of specific identification of a binding sequence in an assay.

Provisional double patenting obviousness type rejection

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 26-42, 46, and 53-56 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 39-45, 47-50, 52-64, 66-69 and 71-76 of copending Application No. 09/362,089 in view of Fodor et al. (5,800,992). Although the conflicting claims are not identical, they are not patentably

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distinct from each other because both sets of claims include a collection of beads comprising attached polymers and an encoding system wherein the polymers are oligonucleotides, polynucleotides or peptides and the encoding system is magnetic, shape or color or combination of these. The '089 claims differ from those of the present application wherein the beads are used in an assay for analyzing a target molecule in a sample. However, it would have been obvious to one of ordinary skill in the art to provide the collection of beads apart from the assay for use in other applications such as nucleic acid sequencing as taught by Fodor et al.. Differences in the particulars of the present claims over the '089 claims such as including the polymer sequence in the coded information, the length of the oligonucleotides, the sequence composition of the oligonucleotides relative to the total number of possible nucleotide sequences of a given oligonucleotide length, the total number of oligonucleotides in the collection of beads, the composition of the bead and their surfaces and chemical reactions of attachment of oligonucleotides to bead surfaces were all taught by Fodor et al. and would have been obvious variations for other applications of interest including fingerprinting and sequencing by hybridization.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

12. No claim is allowed.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephanie Zitomer whose telephone number is (703) 308-3985. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, W. Gary Jones, can be reached on (703) 308-1152. The official fax phone number for this Group is (703) 308-4242. The unofficial fax number is (703) 308-8724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.



Stephanie Zitomer, Ph.D.
April 6, 2001

STEPHANIE W. ZITOMER
PRIMARY EXAMINER